

**KAREY LANE WELL INC (PWS 7100081)
SOURCE WATER ASSESSMENT FINAL REPORT**

October 11, 2001



**State of Idaho
Department of Environmental Quality**

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Karey Lane Well Inc, Bonneville County, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Karey Lane Well Inc. drinking water system consists of two well sources. The wells have a high susceptibility rating to inorganic, volatile organic, synthetic organic, and microbial contamination due to a high rating in hydrologic sensitivity, a moderate to high rating for system construction, and numerous potential contaminant sources. In June 2000, Well #1 recorded the presence of the synthetic organic contaminant Di(2-ethylhexyl)phthalate. Well #2 has not recorded the presence of synthetic organic contaminants. Neither well has recorded the presence of volatile organic contamination during any water chemistry tests. The inorganic contaminant fluoride has been detected, but at levels well below the Maximum Contaminant Level. Nitrate concentrations have been consistently below 3.2 mg/l in Well #1 and below 1.8 mg/l in Well #2. Despite the system not having a disinfection system, there have been no confirmed detections of total coliform bacteria in the system. The presence of contaminants in the drinking water system over the years provides convincing evidence to Karey Lane Well Inc., and should remind it, to be aware that the potential for contamination to/from the aquifer exists. Surrounding agricultural land use practices have contributed to the ratings of “High” for County Level Nitrogen Fertilizer Use, County Level Herbicide Use, and Total County Level Ag-Chemical Use. In addition, the delineation for Karey Lane Well Inc., crosses an organics priority area for the synthetic organic pesticide Atrazine.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For Karey Lane Well Inc., source water protection activities should first focus on correcting any deficiencies outlined in the Sanitary Survey. Additionally, there should be a focus on implementation of practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources in the area. Any spills from the numerous commercial potential contaminant sources should be dealt with quickly and efficiently. If the synthetic organic contaminant Di(2-ethylhexyl)phthalate is detected again, an effort should be made to discover the source of the contamination and clean it up. Because much of the designated protection areas are outside the direct jurisdiction of the Karey Lane Well Inc., partnerships with state and local agencies and industry groups should be established and are critical to the success of

source water protection. All wells should adhere to sanitary survey standards regarding wellhead protection. Also, disinfection practices should be implemented if microbial contamination problems arise.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation contains some urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors through the delineation, the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water assessment protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR KAREY LANE WELL INC, IDAHO FALLS, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for the Karey Lane Well Inc. is comprised of two ground water wells that serve approximately 48 people through approximately 14 connections. The wells are located in Bonneville County, just south of Highway 20 to the west of 55th (Figure 1).

The most significant current water chemistry problem is the Well #1, June 2000 detection of the synthetic organic contaminant (SOC) Di(2-ethylhexyl)phthalate. Other than that detection, there are no significant water chemistry problems in the ground water, but there have been detections in the well water of the inorganic contaminants (IOCs) fluoride and nitrate at levels below the current Maximum Contaminant Levels (MCLs). Total coliform bacteria have not been detected in the system. No SOC's have been detected in Well #2 and neither well has had a detection of volatile organic contaminants (VOCs) in the well water. The delineations do cross an SOC priority area for the pesticide Atrazine. In addition, "County Level Nitrogen Fertilizer Use", "County Level Herbicide Use", and "Total County Level Ag-Chemical Use" are high for this area.

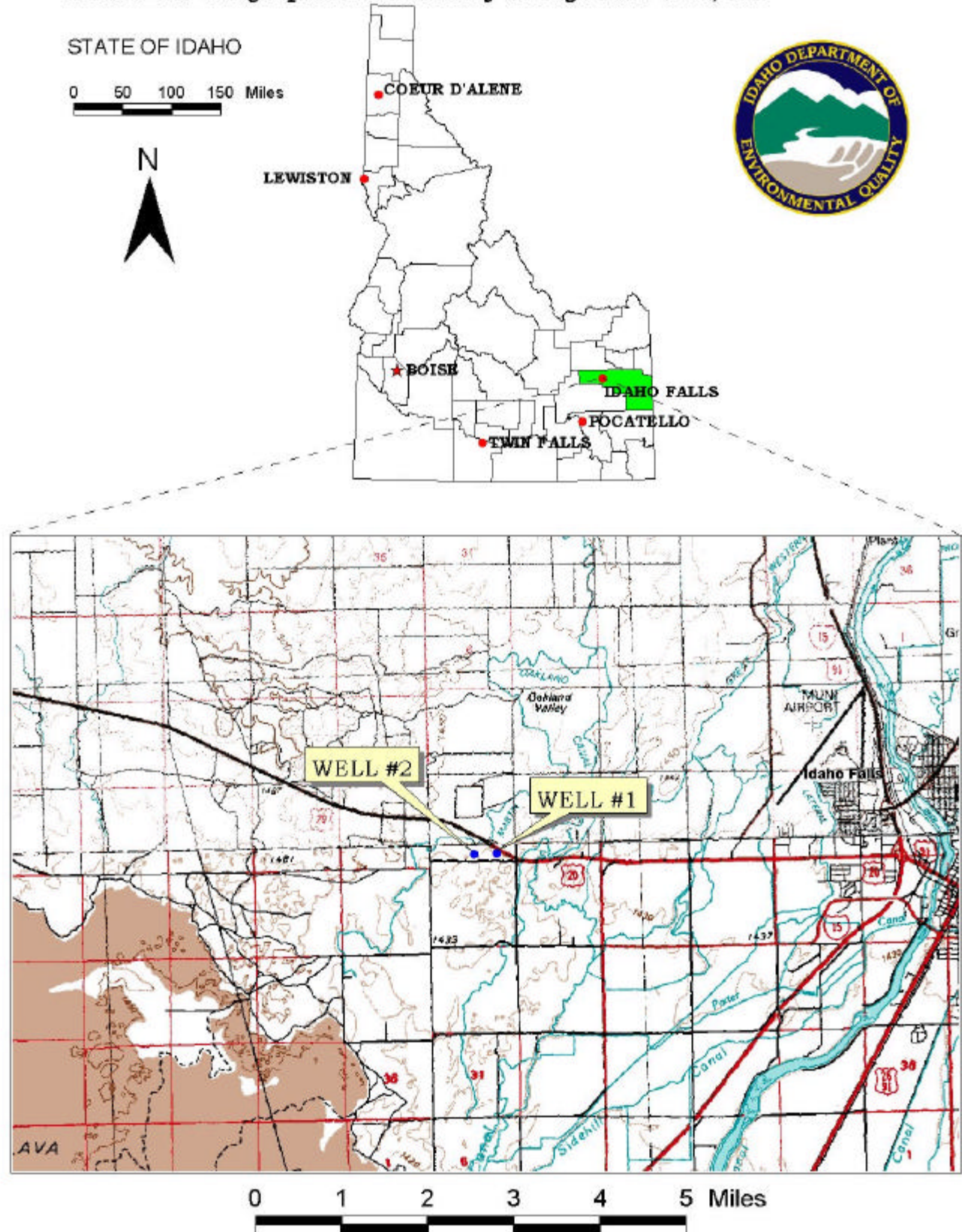
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Eastern Snake River Plain (ESRP) aquifer in the vicinity of the Karey Lane Well Inc. wells. The computer model used site specific data, assimilated by WGI from a variety of sources including the Karey Lane Well Inc operator input, system well logs, other local area well logs, and hydrogeologic reports (detailed below).

The ESRP is a northeast trending basin located in southeastern Idaho. Ten thousand square miles of the basin are primarily filled with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with terrestrial and lacustrine (lake deposit) sediments along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet in thickness and average 20 to 25 feet (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The plain is bound on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. Rivers and streams entering the plain from the south are tributary to the Snake River. Other than the Big and Little Wood rivers, rivers entering from the north vanish into the highly transmissive basalts of the Snake River Plain aquifer.

FIGURE 1. Geographic Location of Karey Lane Well, Inc



The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet it may be locally confined in some areas because of inter-bedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from several hundred feet near the plain's margin to thousands of feet near the center.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999, p. 21; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Ground water flow direction at the local scale is thought to be highly variable due to preferential flow paths through the fractured and layered basalts.

The delineated source water assessment areas for the Karey Lane Well Inc. wells can best be described as corridors approximately 5 miles long and 2 miles wide extending to the northeast of the Karey Lane Well Inc. and ending at the Snake River (Figures 2 and 3). The delineations only have the 3-year TOT because the Snake River is assessed to be the main source of the wells' water. The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area of the Karey Lane Well Inc. wellheads consists of a residential uses, while the surrounding area is predominantly irrigated agriculture, urban, and commercial.

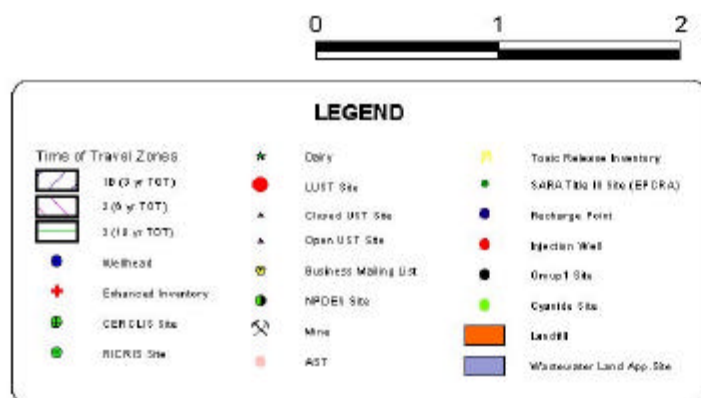
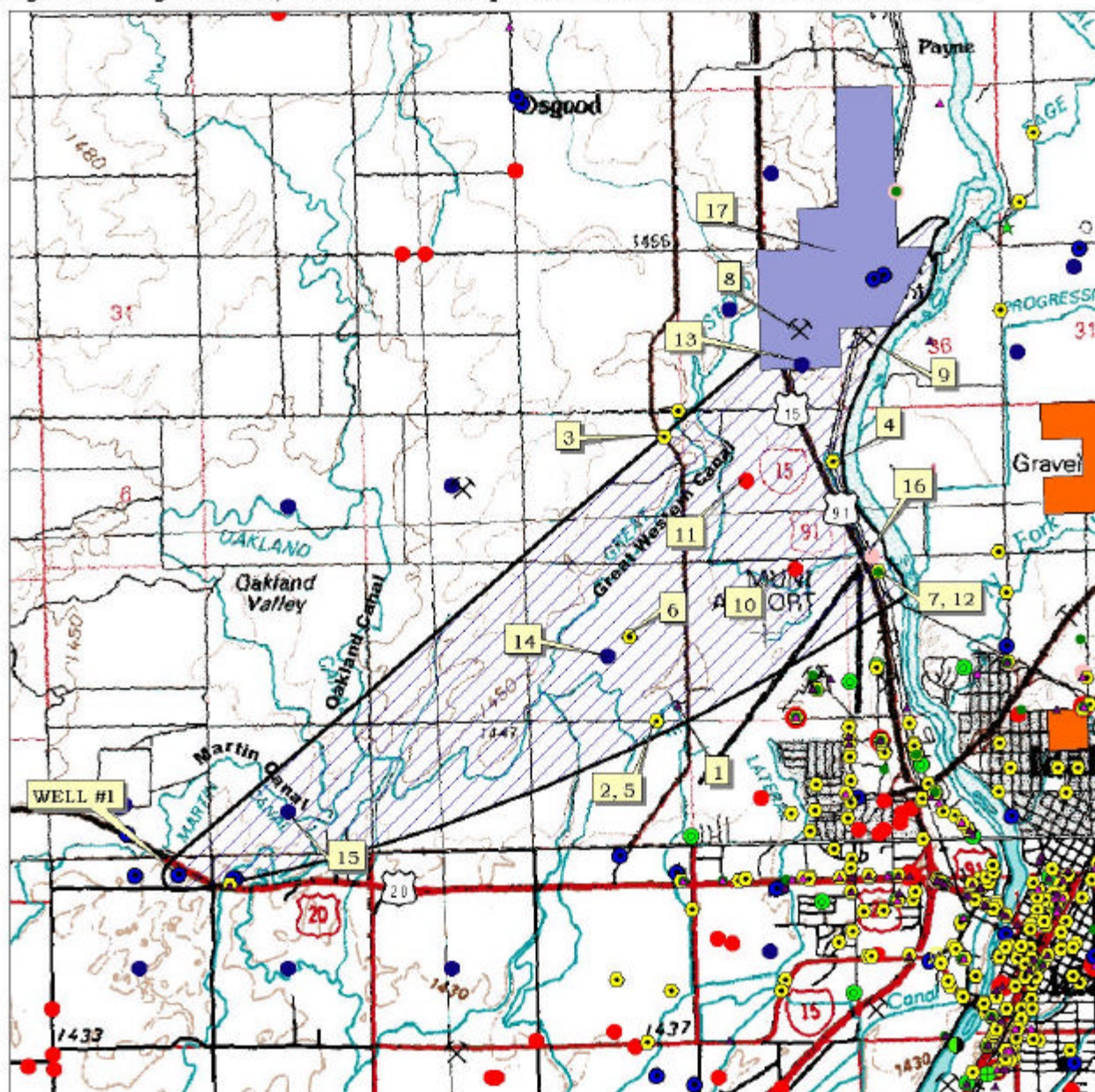
It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in May 2001. The first phase involved identifying and documenting potential contaminant sources within the Karey Lane Well Inc Source Water Assessment Area (Figure 2) through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

As the wells are very close to one other, the two wells have similar delineations. The delineated source water areas encompass corridors of land between the well sites and the Snake River. The Well #1 (Table 1, Figure 2) delineation has 17 potential contaminant sources including multiple underground storage tanks (USTs), a leaking underground storage tank (LUST) site, multiple commercial and light industrial sites to the northwest of the City of Idaho Falls, two sand and gravel pits, two active deep injection wells, three unused recharge points, a wastewater land application site, and a site regulated under the Superfund Amendments and Reauthorization Act (SARA). The Well #2 (Table 2, Figure 3) delineation has 18 potential contaminant sources including all the sources of Well #1 and an additional general contractor. Additionally, the delineations cross U.S. Highways 20 and 91, Interstate 15, the Union Pacific Railroad, the Idaho Falls Municipal Airport, and the Snake River.

Figure 2. Karey Lane Well, Inc. Delineation Map and Potential Contaminant Source Locations



PWS# 7100081
WELL: #1

Table 1. Karey Lane Well Inc Well #1, Potential Contaminant Inventory

SITE #	Source Description ¹	TOT Zone ² (years)	Source of Information	Potential Contaminants ³
1, 2	UST – closed, Concrete Contractor	0-3	Database Search	IOC, VOC, SOC
3	Tractor-Repairing & Service	0-3	Database Search	IOC, VOC, SOC
4	Animal Shelters	0-3	Database Search	IOC, Microbes
5	Storage-Household & Commercial	0-3	Database Search	IOC, VOC, SOC, Microbes
6	Home Builders	0-3	Database Search	IOC, VOC, SOC
7, 12, 16	Asphalt & Asphalt Products, SARA, AST	0-3	Database Search	IOC, VOC, SOC
8	Sand and Gravel Pit	0-3	Database Search	IOC
9	Sand and Gravel Pit	0-3	Database Search	IOC
10	Active Deep Injection Well	0-3	Database Search	IOC, VOC, SOC, Microbes
11	Active Deep Injection Well	0-3	Database Search	IOC, VOC, SOC, Microbes
13	Unused Recharge Point	0-3	Database Search	IOC, VOC, SOC
14	Unused Recharge Point	0-3	Database Search	IOC, VOC, SOC
15	Unused Recharge Point	0-3	Database Search	IOC, VOC, SOC
17	WLAP site	0-3	Database Search	IOC, VOC, SOC, Microbes
	Highway 20	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Highway 15/91	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Airport	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	0-10	GIS Map	IOC, VOC, SOC, Microbes

¹ UST = underground storage tank, AST = above ground storage tank,

SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 3. Karey Lane Well, Inc. Delineation Map and Potential Contaminant Source Locations

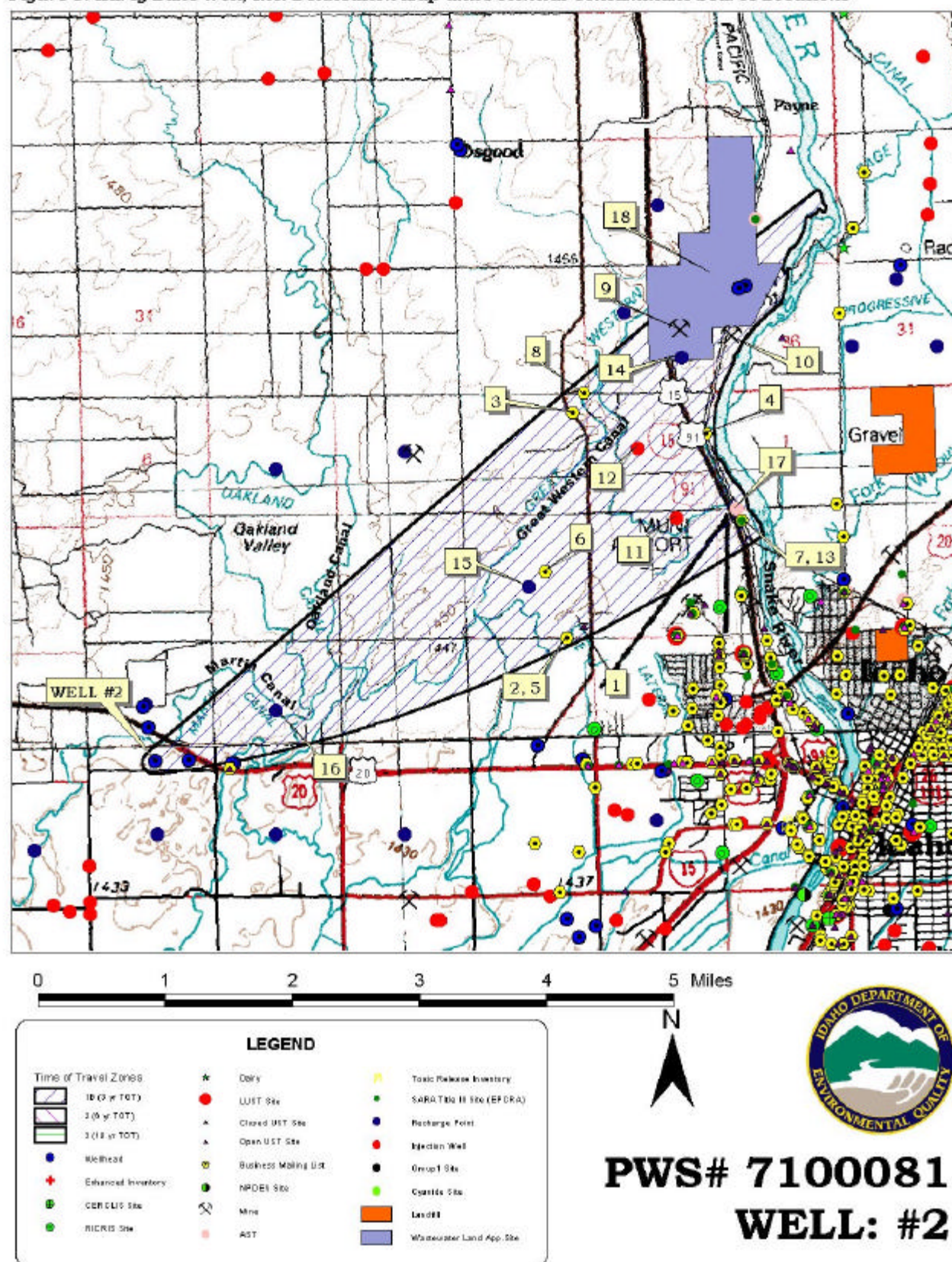


Table 2. Karey Lane Well Inc Well #2, Potential Contaminant Inventory

SITE #	Source Description ¹	TOT Zone ² (years)	Source of Information	Potential Contaminants ³
1, 2	UST – closed, Concrete Contractor	0-3	Database Search	IOC, VOC, SOC
3	Tractor-Repairing & Service	0-3	Database Search	IOC, VOC, SOC
4	Animal Shelters	0-3	Database Search	IOC, Microbes
5	Storage-Household & Commercial	0-3	Database Search	IOC, VOC, SOC, Microbes
6	Home Builders	0-3	Database Search	IOC, VOC, SOC
7, 13, 17	Asphalt & Asphalt Products, SARA, AST	0-3	Database Search	IOC, VOC, SOC
8	Concrete Contractor			
9	Sand and Gravel Pit	0-3	Database Search	IOC
10	Sand and Gravel Pit	0-3	Database Search	IOC
11	Active Deep Injection Well	0-3	Database Search	IOC, VOC, SOC, Microbes
12	Active Deep Injection Well	0-3	Database Search	IOC, VOC, SOC, Microbes
14	Unused Recharge Point	0-3	Database Search	IOC, VOC, SOC
15	Unused Recharge Point	0-3	Database Search	IOC, VOC, SOC
16	Unused Recharge Point	0-3	Database Search	IOC, VOC, SOC
18	WLAP site	0-3	Database Search	IOC, VOC, SOC, Microbes
	Highway 20	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Highway 15/91	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Airport	0-3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	0-10	GIS Map	IOC, VOC, SOC, Microbes

¹ UST = underground storage tank, AST = above ground storage tank,

SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-

grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity is high for the wells (Table 3). This is a result of the soils being in the moderately to well-drained class, the vadose zone composition of fractured basalt, and the fact that the water table is less than 300 feet from the surface. Additionally, the system well logs show that there is not a laterally extensive low-permeability unit to retard the downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in Sanitary Surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

Well #1 has a moderate system construction score. Well #1, drilled in 1975, is 260 feet deep. The water table is approximately 200 feet below ground surface (bgs). The casing and annular seal are installed to 19 feet bgs into fractured basalt. The 1995 Sanitary Survey indicates that Well #1 is in compliance for the regulations related to wellhead and sanitary seal protection. Additionally, Well #1 is protected from surface flooding.

Well #2 has a high system construction score. Well #2, drilled in 1977, is 240 feet deep. The water table is approximately 200 feet bgs. The casing and annular seal are installed to 19 feet bgs into fractured basalt. The 1995 Sanitary Survey indicates that Well #2 is not in compliance for the regulations related to wellhead and sanitary seal protection. Additionally, Well #2 is not protected from surface flooding.

A determination could be made as to whether current public water system (PWS) construction standards are being met. Though the wells may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. The regulations address such issues as pump tests, depth of annular seal and casing, and casing thickness. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Eight-inch diameter wells require a casing thickness of at least 0.312-inches. Both wells used 0.250-inch casing thickness. As such, the wells were assessed an additional point in the system construction rating.

Potential Contaminant Source and Land Use

The wells rate high for IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products), and SOC (i.e. pesticides), and moderate for microbial contaminants (i.e. bacteria). Agricultural and commercial land uses in the delineated source area accounts for the largest contribution of points to the potential contaminant inventory rating.

The wells fall within the SOC priority area for the pesticide Atrazine. The wells are also in a county with high levels of herbicide use and high total ag-chemical use. The most significant current water chemistry problem is the Well #1, June 2000 detection of the SOC Di(2-ethylhexyl)phthalate. Fortunately, no other significant water chemistry problems have been recorded in the finished well water. The wells have consistently shown the IOC nitrate at levels below 3.2 mg/l in Well #1 and below 1.8 mg/l in Well #2 (the MCL is 10 mg/l). Total coliform bacteria, SOC in Well #2, and VOCs have never been detected in the tested well water.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, a detection of total coliform bacteria or fecal coliform bacteria at the wellhead, or potential sources of contamination within 50 feet of the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. In this case, Well #1 automatically rates high for SOC because of the June 2000 detection of Di(2-ethylhexyl)phthalate. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, both wells rate high for all categories.

Table 3. Summary of Karey Lane Well Inc Susceptibility Evaluation

Well	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	H	H	H	L	M	H	H	H(*) ²	H
Well #2	H	H	H	H	L	H	H	H	H	H

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

² H(*) = Well scores high overall as well as automatically high due to SOC detection in June 2000

Susceptibility Summary

Overall, both wells rate high for all categories. The well-drained nature of the soils, the numerous commercial and agricultural land uses, and the high county-wide use of agricultural chemicals add up to the high susceptibility ratings. The high ranking in hydrologic sensitivity also contributed to the high scores.

The most significant current water chemistry problem is the Well #1, June 2000 detection of the SOC Di(2-ethylhexyl)phthalate. Other than that detection, there are no significant water chemistry problems in the ground water, but there have been detections in the well water of the IOCs fluoride and nitrate at levels below the current MCLs. Total coliform bacteria have not been detected in the system. No SOC's have been detected in Well #2 and neither well has had a detection of VOCs in the well water. The delineations do cross an SOC priority area for the pesticide Atrazine. In addition, "County Level Nitrogen Fertilizer Use", "County Level Herbicide Use", and "Total County Level Ag-Chemical Use" are high for this area.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For Karey Lane Well Inc., source water protection activities should first focus on correcting any deficiencies outlined in the Sanitary Survey. Additionally, there should be a focus on implementation of practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources in the area. Any spills from the numerous commercial potential contaminant sources should be dealt with quickly and efficiently. If the SOC Di(2-ethylhexyl)phthalate is detected again, an effort should be made to discover the source of the contamination and clean it up. Because much of the designated protection areas are outside the direct jurisdiction of the Karey Lane Well Inc., partnerships with state and local agencies and industry groups should be established and are critical to the success of source water protection. All wells should adhere to sanitary survey standards regarding wellhead protection. Also, disinfection practices should be implemented if microbial contamination problems arise.

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A community must incorporate a variety of strategies in order to develop a comprehensive drinking water assessment protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office (208) 528-2650

State DEQ Office (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

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- DeSonneville, J.L.J., 1972, Development of a Mathematical Groundwater Model: Water Resources Research Institute, University of Idaho, Moscow, Idaho, 227 p.
- Garabedian, S.P., 1992, Hydrology and Digital Simulation of the Regional Aquifer System, Eastern Snake River Plain, Idaho, U.S. Geological Survey Professional Paper 1408-F, 102 p.
- Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."
- Idaho Department of Agriculture, 1998. Unpublished Data.
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- Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.
- Lindholm, G.F., 1996, Summary of the Snake River Plain Regional Aquifer-System Analysis in Idaho and Eastern Oregon, U.S. Geological Survey Professional Paper 1408-A, 59 p.
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Attachment A

Karey Lane Well Inc Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.273)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report

Public Water System Name :

KAREY LANE WELL INC

Well# : WELL #1

Public Water System Number 7100081

07/20/2001 11:33:43 AM

1. System Construction		SCORE			
Drill Date	07/05/1977				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	1995			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	YES	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	18	15	15	8
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	11	7	6	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	16	18	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II		0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		25	23	27	14
4. Final Susceptibility Source Score		15	15	15	15
5. Final Well Ranking		High	High	High	High

1. System Construction		SCORE			
	Drill Date	07/07/1977			
	Driller Log Available	YES			
	Sanitary Survey (if yes, indicate date of last survey)	YES	1995		
	Well meets IDWR construction standards	NO	1		
	Wellhead and surface seal maintained	NO	1		
	Casing and annular seal extend to low permeability unit	NO	2		
	Highest production 100 feet below static water level	NO	1		
	Well located outside the 100 year flood plain	NO	1		
Total System Construction Score			6		
2. Hydrologic Sensitivity					
	Soils are poorly to moderately drained	NO	2		
	Vadose zone composed of gravel, fractured rock or unknown	YES	1		
	Depth to first water > 300 feet	NO	1		
	Aquitard present with > 50 feet cumulative thickness	NO	2		
Total Hydrologic Score			6		
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
	Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2
	Farm chemical use high	YES	2	0	2
	IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
	Contaminant sources present (Number of Sources)	YES	19	16	16
	(Score = # Sources X 2) 8 Points Maximum		8	8	8
	Sources of Class II or III leacheable contaminants or	YES	11	7	6
	4 Points Maximum		4	4	4
	Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2
	Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B			16	16	18
Potential Contaminant / Land Use - ZONE II					
	Contaminant Sources Present	YES	2	2	2
	Sources of Class II or III leacheable contaminants or	YES	1	1	1
	Land Use Zone II		0	0	0
Potential Contaminant Source / Land Use Score - Zone II			3	3	3
Potential Contaminant / Land Use - ZONE III					
	Contaminant Source Present	YES	1	1	1
	Sources of Class II or III leacheable contaminants or	YES	1	1	1
	Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone III			2	2	2
Cumulative Potential Contaminant / Land Use Score			25	23	27
4. Final Susceptibility Source Score			17	17	17
5. Final Well Ranking		High	High	High	High